Results of the Mercury in Fish Interstate Network (FIN) Demonstration Project
Tulane Center of Excellence for Environmental Public Health Tracking

The TCOE, along with several of its EPHT partners, explored the feasibility of establishing a Mercury in Fish Interstate Network (Mercury FIN). The goal of the network was to demonstrate and implement the EPHT framework using fish tissue data. Specifically, the Mercury FIN is intended to integrate routinely collected fish tissue data for EPHT purposes. The project was a means to demonstrate the steps, processes and methods needed to implement a tracking network. Additionally, the network tested and evaluated products from EPHT workgroups, particularly the Standards and Network Development workgroup. The benefits were two-fold: 1) This effort tested the implementation of products and processes developed by the Standards and Network Development workgroup and its subgroups, including Trading Partner Agreements and Metadata recommendations; and 2) It assessed the availability and condition of fish tissue data, and the feasibility of using it in the EPHT framework.

The initial phase of the project identified information about existing data that is available to support a multi-state network. Publicly available federal and state fish tissue databases were reviewed along with any guidance on standardization of these databases. This provided a baseline to create a survey on fish tissue data and other mercury data sources that was distributed to state partners. The Mercury FIN Data Survey consisted of 12 questions which asked about data fields collected; availability of metadata and data dictionaries; additional sources of mercury data; and collection of data relating to fishing licenses and fish consumption surveys (Appendix 1). The responses to this survey provided information regarding the availability of this data, the condition of the data, and the availability of metadata.

Survey Responses

Surveys were sent to nine EPHT state partners (FL, IL, LA, ME, MO, MT, OK, NH, WA) that expressed interest in the Mercury FIN. Six states responded to the survey. The first question asked state partners to identify the data fields collected for mercury levels in fish tissues. Table 1 shows the responses.

Table 1. Is your department/agency currently collecting these data fields for mercury levels in fish tissues?

Fish Sampling Data Fields	Number of Respondents (N=6)
Station ID	6
Water body (Site Name)	6
Location Description	6
County	5
Latitude	6
Longitude	6
Collection Date	6
Collection Time	2
Collection Method (e.g.., electroshock, seine)	4

Fish Species	6
Sample Type (e.g., whole, fillet, composite)	6
Number of fish (if composite)	6
Lipid (% fish content of fish sample)	3
Length	6
Weight	6
Sample ID	4
Mercury Species (e.g., total, methylmercury)	5
Analytical Method	4
Analytical Detection Limit	6
Result	6

The fourth question asked respondents to indicate the media format in which the data are stored (Table 2).

Table 2.

Data Source Formats	**Number of Respondents (N=6)**
Microsoft Excel or other spreadsheet	5
Microsoft Access or other database	2
Microsoft Word of other text file	0
Adobe PDF	0
Website/ HTML	1
Paper	4
Other (Please list at right)	2 (STORET, Oracle database)

Question eight asked respondents to identify any additional data sources for which their department/agency currently collects data on mercury (Table 3).

Table 3.

Additional Data Sources	**Number of Respondents (N=6)**
Mercury Deposition Network	1
Toxic Release Inventory	3
Toxic Emissions Inventory	5
Other air monitoring	1
Water Quality Monitoring	2
Sediment	2
Mercury sources/emitters and their locations	2

The remaining survey questions were concerned about additional data fields that may be collected, tissue analysis for additional compounds, availability of metadata and data

dictionaries, additional agency data sources relevant to tracking mercury contamination, availability of information on fishing licenses and fish consumption surveys. The responses are summarized in Table 4.

Table 4.

Question	**Number of Respondents (N=6)**
Please list any additional data fields that your agency/department is collecting for mercury levels in fish tissues.	0
Does your department/agency analyze fish tissues for compounds other than mercury?	5 (PCBs, herbicides, lead, cadmium, copper, DDTs, dioxins, furans, pesticides, volatile and semi-volatile compounds)
Is metadata available for the mercury in fish dataset(s)?	0
Is a data dictionary available for the mercury in fish dataset(s)?	0
Please list other data sources in your state that you feel would be relevant to Mercury FIN.	EPA project on whole body fish residues
Does your department/agency collect information on fishing licenses?	3
Has your department ever conducted fish consumption surveys (e.g., creel surveys, market-basket surveys, telephone interviews, BRFSS, etc)? If so, please list the type(s) of survey(s).	4 (angler survey; fish consumption survey; creel surveys; surveys on catch rates)

Data were received from two state partners. Table 5 shows the results of a comparison data fields identified as being collected based on the survey responses with the data received from the host agency.

Table 5.

Fish Sampling Data Fields	Agency 1		Agency 2	
	Survey Response	Data Received	Survey Response	Data Received
Station ID	X	X	X	
Water body (Site Name)	X	X	X	X
Location Description	X	X	X	
County	X	X	X	X
Latitude	X	X	X	X
Longitude	X	X	X	X
Collection Date	X	X	X	X
Collection Time			X	
Collection Method (e.g.., electroshock, seine)			X	
Fish Species	X	X	X	X
Sample Type (e.g., whole, fillet, composite)	X	X	X	
Number of fish (if composite)	X	X	X	
Lipid (% fish content of fish sample)	X	X		
Length	X		X	X

Weight	X	X	X	X
Sample ID			X	X
Mercury Species (e.g., total, methylmercury)	X		X	
Analytical Method			X	
Analytical Detection Limit	X	X	X	
Result	X	X	X	X

The data fields identified as being collected by Agency 1 on the survey (n=16) are in close agreement with the data fields in the data (n=14). The exceptions are length and mercury species. There are greater discrepancies in the number of reported data fields (n=19) for Agency 2 and the number of fields in the actual data (n=10). The fields for which data are not collected are Station ID, Location Description, Collection Time, Collection Method, Sample Type, Number of Fish, Mercury Species, Analytical Method, and Analytical Detection Limit.

Evaluation of Trading Partner Agreement

State partners were asked to evaluate the administrative application of the Trading Partner Agreement (TPA) for data exchange and transfer. The TPA was developed by the EPHT Standards and Network Development workgroup, Data Sharing and Access subgroup. Tulane staff completed a TPA for each partner based on the TPA template model, making modifications that were specific to obtaining fish tissue data. Elements of the TPA include:

- Introduction
- Data description
- Data management
- Data access and security levels
- Contract management and administration
- Other Considerations

A TPA was completed for data acquisition from one agency without modification after their internal review. One agency would not complete the TPA due to the onerous legal review it required, and directed us to retrieve the data from US EPA's STORET database (identifying known errors in data). Two agencies did not require a TPA for data exchange as this data is considered public record and available to any agency, institution or individual.

Evaluation of the Metadata template

State partners were asked to evaluate the Metadata "Test Kit", developed by the EPHT Standards and Network Development workgroup, Metadata and Data Quality subgroup, which includes tools for creating metadata. None of our respondents indicated the availability of metadata for their fish tissue data or ability to create metadata using the "Test Kit" due to lack of resources, time and personnel.

Discussion/Recommendations

While states collect mercury in fish tissue data, the survey results show the lack of standardization in state data collection procedures. There are no mandates for which data fields should be collected or common formats for storing the data. Agencies utilize the data for specific programs and are unaware of its value for other efforts. While not opposed to data sharing, few resources are available to prepare the data for inclusion in other tracking systems (e.g., creating metadata).

Additionally, the project tested and evaluated the Trading Partner Agreement and Metadata "Test Kit" developed by the EPHT Standards and Network Development workgroup. The need for Trading Partners Agreements (TPA) is case-specific and internal legal issues can impede completion of a TPA. Furthermore, some agencies don't see the need for a TPA as the data is publicly available. Metadata are not widely generated for environmental data. Currently, agency internal need for metadata is not a priority as the data are generally used within a specific program and not shared with external departments/agencies. Additionally, state agencies lack the resources for generating metadata.

Mercury FIN has two outputs: 1) it tested the implementation of products and processes developed by the EPHT Standards and Network Development workgroup and its subgroups, including Trading Partner Agreements and Metadata recommendations; and 2) it assessed the availability and condition of fish tissue data, and the feasibility of using it in the EPHT framework. This project illustrated data issues that present barriers to a nationwide tracking network. For EPHT to use existing data in a tracking system, simple tools and incentives may be needed to encourage data custodians to generate metadata for inclusion in EPHT.